AMENDMENTS TO THE CLAIMS

Please cancel claim 160 without prejudice or disclaimer. Please amend claim 161. Deletions appear in ~~strikethrough font~~, and additions are <u>underlined</u>. This listing of claims will replace all prior versions and listings of claims in the application.

Complete listing of the claims

Claims 1-6 (Canceled)

7.   (Previously presented) A method of analyzing patterns, comprising:

receiving a first diffraction pattern;

receiving a second diffraction pattern;

receiving a third diffraction pattern;

detecting the characteristic peaks of the first diffraction pattern;

detecting the characteristic peaks of the second diffraction pattern;

detecting the characteristic peaks of the third diffraction pattern;

determining a first similarity between the first and the second diffraction patterns based on the characteristic peaks of the first and the second diffraction patterns;

determining a second similarity between the first and the third diffraction patterns based on the characteristic peaks of the first and the third diffraction patterns;

determining a third similarity between the second and the third diffraction patterns based on the characteristic peaks of the second and the third diffraction patterns;

performing hierarchical cluster analysis on the first, the second, and the third diffraction pattern based on the determined first, second, and third similarity; and

displaying the results of the hierarchical cluster analysis;

wherein the characteristic peaks are detected by computing the variance of the diffraction patterns.

Claims 8-12 (Canceled)

13.   (Previously presented) A method of analyzing patterns, comprising:

receiving a first diffraction pattern;

receiving a second diffraction pattern;

receiving a third diffraction pattern;

detecting the characteristic peaks of the first diffraction pattern;

detecting the characteristic peaks of the second diffraction pattern;

detecting the characteristic peaks of the third diffraction pattern;

determining a first similarity between the first and the second diffraction patterns
based on the characteristic peaks of the first and the second diffraction
patterns;

determining a second similarity between the first and the third diffraction patterns
based on the characteristic peaks of the first and the third diffraction patterns;

determining a third similarity between the second and the third diffraction
patterns based on the characteristic peaks of the second and the third
diffraction patterns;

performing hierarchical cluster analysis on the first, the second, and the third
diffraction pattern based on the determined first, the second, and the third
similarity; and

displaying the results of the hierarchical cluster analysis;

wherein the characteristic peaks are detected by a method comprising:

determining the peaks of the diffraction patterns; and

assigning probability scores to the determined peaks of the diffraction pattern.

Claim 14 (Canceled)

15.   (Previously presented) The method of claims 157 or 158, wherein discretely
allocating the characteristic peaks comprises discretely allocating the
characteristic peaks into a first, a second, a third, and a fourth group based on
the assigned probability scores.

16.   (Previously presented) The method of claim 15, wherein determining the similarities based on the characteristic peaks comprises comparing one or more characteristic peaks in the first diffraction pattern with one or more characteristic peaks in the second diffraction pattern.

17.   (Previously presented) The method of claim 16, wherein comparing one or more characteristic peaks in the first diffraction pattern with one or more characteristic peaks in the second diffraction pattern further comprises:
for each characteristic peak in the first group of the first diffraction pattern, comparing the characteristic peak in the first group of the first diffraction pattern with the characteristic peaks in the first, second, or third group of the second diffraction pattern and penalizing a matching score if the characteristic peak in the first group of the first diffraction pattern is not found in the first, second, or third group of the second diffraction pattern.

18.   (Previously presented) The method of claim 17, wherein comparing one or more characteristic peaks in the first diffraction pattern with one or more characteristic peaks in the second diffraction pattern further comprises:
for each characteristic peak in the second group of the first diffraction pattern, comparing the characteristic peak in the second group of the first diffraction pattern with the characteristic peaks in the first, second, third, or fourth group of the second diffraction pattern and penalizing a matching score if the characteristic peak in the first group of the first diffraction pattern is not found in the first, second, third, or fourth group of the second diffraction pattern.

19.   (Previously presented) The method of claim 16, wherein determining the similarities based on the characteristic peaks further comprises matching the diffraction patterns based on the characteristic peaks, wherein matching the diffraction patterns based on the characteristic peaks further comprises comparing one or more characteristic peaks in a diffraction pattern with one or more characteristic peaks in another diffraction pattern.

Claims 20-34 (Canceled)

35.   (Original) The method of claim 16, wherein comparing the peaks further comprises matching a split peak with a peak having a shoulder as an acceptable match.

Claims 36-156 (Canceled)

157.   (Previously presented) A method of analyzing patterns, comprising:
        receiving a first diffraction pattern;
        receiving a second diffraction pattern;
        detecting the characteristic peaks of the first diffraction pattern;
        detecting the characteristic peaks of the second diffraction pattern;
        determining a similarity between the first and the second diffraction patterns
            based on the characteristic peaks of the first and the second diffraction
            patterns;
        performing hierarchical cluster analysis on the first and second diffraction pattern
            based on the determined similarity; and
        displaying the results of the hierarchical cluster analysis;
        wherein the characteristic peaks are detected by a method comprising:
                determining the peaks of the diffraction patterns; and
                assigning probability scores to the determined peaks of the diffraction
                    pattern; and
        wherein the method of analyzing patterns further comprises discretely allocating
        the detected characteristic peaks into one or more groups based on the assigned
        probability scores.

158.   (Previously presented) The method of claim 157, wherein discretely allocating the detected characteristic peaks comprises discretely allocating the determined characteristic peaks into one or more groups based on the assigned probability scores.

159. (Previously presented) The method of claims 13 or 157 further comprising classifying the characteristic peaks by discretely allocating the detected characteristic peaks into one or more groups based on the assigned probability scores.

Claim 160 (cancelled)

161. (Currently amended) The method of ~~claims~~ claim 13, ~~or 160~~ wherein the results of the hierarchical cluster analysis are displayed as a dendrogram.

162. (Previously presented) The method of claim 159 wherein the results of the hierarchical cluster analysis are displayed as a dendrogram.

163. (Previously presented) The method of claim 13, wherein the characteristic peaks are detected by computing the variance of the diffraction patterns.